

Comments on:
ENVIRONMENTAL TOBACCO SMOKE:
A GUIDE TO WORKPLACE SMOKING POLICIES
[Draft] EPA 400/6-90/004

Response Addressing:
Chapter 1: What Is ETS?
Table (page 10):
"Toxic and Cancer Causing Agents in Mainstream
and Sidestream Cigarette Smoke"

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SUMMARY: The data table, "Toxic and Cancer-Causing Agents in Mainstream and Sidestream Cigarette Smoke" in Chapter 1, page 10 of The EPA draft document, "Environmental Tobacco Smoke: A Guide to Workplace Smoking Policies," is misleading, inaccurate and unsubstantiated. It should be extensively revised, or deleted from the document.

COMMENTARY: The data table, "Toxic and Cancer-Causing Agents in Mainstream and Sidestream Cigarette Smoke", appearing in Chapter 1 (page 10) of the EPA draft document, "Environmental Tobacco Smoke: A Guide to Workplace Smoking Policies", contains inaccurate and misleading data. The relevance of the table to a discussion of environmental tobacco smoke is questionable. General and specific objections are enumerated below.

General Comments:

- 1) The table presents data only for **mainstream** and **sidestream** cigarette smoke, not environmental tobacco smoke (ETS), despite the fact that ETS data are available for some of the compounds reported. (See specific comments below.)
- 2) Because the table presents mainstream and sidestream concentration data within the context of an ETS document, the impression is given that comparable concentration levels exist in ETS. This is misleading and untrue.

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[e.g. See specific comments below.]

- 3) The table is unreferenced in the text!
- 4) Basis units for the table are missing ("per cigarette"?). Mass units within the table are missing for one entry, incorrect for others.
- 5) Not all compounds in the table have been reported to be "Toxic and Cancer-Causing Agents" (e.g. ammonia). Consequently the table is mislabeled and deceptive.
- 6) The specific cigarettes smoked to produce the data in the table are never identified. Neither are references given for the analytical procedures used. As a result, it is impossible to judge the accuracy of the concentrations reported.

Specific Comments:

Because units are incorrect, cigarettes are unidentified and analytical procedures unspecified, it is not possible to ascertain the accuracy of the data.

- 1) It is nowhere stated that table entries are reported on a "per cigarette" basis.

In addition, there are several "unit" errors in the entries. These are pointed out in the attached comparison table.

- 2) Literature ETS data (i.e. actual ETS measurements) exist for several of the compounds included in the table; e.g., benzo[α]pyrene [1,2], phenol [3], catechol [3], hydroquinone [3], ammonia [4].
- 3) Assuming nanogram units (as opposed to the incorrect milligram units appearing in the table), B[a]P concentrations for mainstream of filtered cigarette B (i.e. a cigarette producing the tar values listed for cigarette B) appears high by approximately 250% [5].
- 4) There are substantial, unexpected differences between the nonfiltered cigarette data in this table and the data in the table on page 10 of the Guide and Table C-2 (page C-19) of the accompanying EPA draft document, "Health Effects of Passive Smoking: Assessment of Lung Cancer in Adults and Respiratory Disorders in Children" ("Health Assessment"). Some differences are detailed in footnotes to the attached comparison table. Others include:
 - a) Catechol: 41.9 ng MS (Guide) vs. 200 ng MS (Health Assessment)
1.8 SS/MS (Guide) vs. 18 SS/MS (Health Assessment)

- b) Ammonia: 7 SS/MS (Guide) vs. 110 SS/MS (Health Assessment)
- c) NPYR: 64.5 ng MS (Guide) vs. 20 ng MS (Health Assessment)
1.8 SS/MS (Guide) vs. 18 SS/MS (Health Assessment)
- d) NNN: 0.85 SS/MS (Guide) vs. 2 SS/MS (Health Assessment)

Tobacco blend differences may account for some discrepancies, but certainly not to the extent reported.

These mistakes are serious and place into question the validity of the entire table. Without justification for its inclusion, and with so many errors, this table should be deleted from the document.

REFERENCES

1. Risner, C. H. and Conner, J. M., "The Quantification of 4- and 6-Ring Polynuclear Aromatic Hydrocarbons in Indoor Air Samples," Presented at the 44th Tobacco Chemists' Research Conference, Sept. 30 - Oct. 3, 1990, Winston-Salem, N.C.
2. Salomaa, S., Tuominen, J. and Skytta, E., "Genotoxicity and PAC Analysis of Particulate and Vapor Phases of Environmental Tobacco Smoke," *Mutation Research*, 204, 173-183 (1988).
3. Risner, C. H. and Cash, S. L., "The Determination of Hydroquinone, Catechol, Phenol and m+p- Cresols in Indoor Air Samples by High Performance Liquid Chromatography," *Envir. Tech.*, 11, 345-352 (1990).
4. Risner, C. H. and Conner, J. M., "A New Device for Collection of Ammonia in Air," to be presented at the American Chemical Society Southeast-Southwest Regional Meeting, Dec. 5-7, 1990.
5. Risner, C. H., "The Determination of Benzo[α]pyrene in the Total Particulate Matter of Cigarette Smoke," *J. Chromatogr. Sci.*, 26 113-120 (1990).

| Table of Guide, page 10 | | | Table C-2, page C-19 | | |
|--|-------------------|-------|----------------------|------------------|-------|
| | MS | SS/MS | | MS | SS/MS |
| Nicotine, mg | 2.04 | 2.26 | | 1.4 ^b | 3 |
| Catechol, µg | 41.9 | 1.4 | | 200 | 0.7 |
| Benzo[a]pyrene, ng | 26.2 ^a | 2.6 | | 30 | 3 |
| Ammonia, µg | 76.0 | 7 | | 90 | 110 |
| N-Nitrosodimethylamine, ng | 31.1 | 24 | | 30 | 60 |
| N-Nitrosopyrrolidine, ng | 64.5 ^a | 1.8 | | 20 | 18 |
| N-Nitrosonornicotine, ng | 1007 | 0.85 | | 1500 | 2 |
| ^a Incorrectly listed as mg instead of ng in Table, p.10 | | | | | |
| ^b Incorrectly listed as 14 mg instead of 1.4 mg | | | | | |